Reviewer's report

Title: Patients Presenting to the Hospital with MRSA Pneumonia: Differentiating Characteristics and Outcomes with Empiric Treatment

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Reviewer: Ji Ye Jung

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The authors identified differentiating characteristics for MRSA pneumonia and evaluated outcomes associated with empiric anti-MRSA therapy. They found current HCAP definition leads to excessive prescribing of anti-MRSA antibiotics and Shorr’s risk scoring schemed improved identification of patients at high risk and low risk for MRSA pneumonia. They provided additional variables for better prediction of MRSA.

Major comments

Study Design
1. The authors compared patients with MRSA matched 1:1 to those with non-MRSA pathogen or negative cultures. However, the matched subjects should only be those with non-MRSA pathogen. Those with negative cultures might be infected with MRSA.

Method
1. Authors need to clarify how 1:1 matching was randomly performed.
2. If no other clinical factors such as age or sex were used for matching, why didn’t they include all the patients (MRSA 134 patients vs. non-MRSA 177 patients)? Matching only the number of subjects in each group to same number would not show any benefits of matching.
3. Statistical analysis
   Authors stated that continuous variables were analyzed using Student’s t-test. However, in non-normally distributed quantitative variables, they should have used a non-parametric test such as Mann Whitney U test. Was distribution of quantitative variables tested?

Results
1. Why those with multiple organisms in the respiratory culture were excluded from this study? Unless MRSA was cultured, they should be included in non-MRSA group.
2. In order to provide more evidence for that current HCAP predicts MRSA more excessively, they need to provide proportion of HCAP in MRSA and non-MRSA groups.
3. What kinds of pathogens were confirmed in non-MRSA group? Proportion of some of the potentially drug resistant pathogen would influence the prognosis of the patients.

Outcomes
1. APACHE score is the one of the ICU scoring system. Although it is also used for predicting patient’s prognosis, patients in ICU and in general wards show different characteristics so I would not recommend to mention APACHE II in this study.
2. What is the reason that they chose APACHE II score # 18 and PSI score # 153 as the risk group? Any statistical analysis was done?
3. As the authors stated, severity of pneumonia confounds the treatment outcome, regression analysis would be nice to see the effect of empiric MRSA treatment on clinical outcomes including mortality, length of stay, and rates of clinical failure.

Minor comments
1. All the abbreviation in every table should be described in the footnote of each table.
2. The format of Table 3 is needed to be changed. Please delete vertical line
3. Table show too many numerical data in one cell. Median (IQR) can be provided only if the variables were non-normally distributed, otherwise mean value with standard deviation would be enough.

Level of interest: An article of limited interest

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declared that I have no competing interests.